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Research Article

Flattening of New Media Design Based on Deep Reinforcement Learning

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In order to strengthen the flat design of new media, this paper proposes the research on the flat design of new media based on deep reinforcement learning. Firstly, this paper introduces the basic principle of deep belief network and lists the flat design methods of new media animation. An algorithm based on deep reinforcement learning is designed, which can gradually fill the missing area image. A set of repair strategy is designed through the new media animation image repair algorithm. Taking animation facial expression recognition Based on deep learning as an example, this paper expounds the theme through the combination of theory and practice. In the Jaffe database and Cohn Kanade database, three new media animations with different resolutions of 16×16, 32×32, and 64×64 are taken as examples, and DBN (Deep Confidence Network) method is compared with other five common classification methods. DBN has the highest identified value. It should be noted that the accuracy of the DBN method is 23.79%, 4.31%, and 4.80% higher than that of MLP under 16×16, 32×32, and 64×64, respectively. The recognition performance of DBNs is almost the highest. Although the classical SVM method has achieved 98.11% recognition rate on 32×32 image, which is higher than the DBN method, the fluctuation of the SVM method is relatively large, and the recognition rate on 16×16 image has declined greatly. Relatively speaking, the recognition rate of the DBN method is relatively stable.

1. Introduction

Digital technology makes the cost of products lower than other technologies with the increase of output, which is conducive to facing the mass market with high demand. Therefore, there is no multimedia without digital technology [1, 2]. The of new media can be roughly divided into five categories: first, the extension of traditional media, such as digital TV and interactive TV; second, integrate media, from communication tools to new media, such as mobile phones; third, crossmedia, from Internet to new media, such as Internet TV; fourth, mass mobile media and vehicle TV (mobile TV); and fifth, outdoor new media and outdoor electronic screen.

In short, the "flattening" of new media design is a design style with "zero three-dimensional" attribute. Flat style is a two-dimensional and completely planar design. In the process of practical application, designers are also constantly exploring whether to properly retain texture, shadow, and other effects. For example, there is also a form of long shadow in flat style UI design. But generally speaking, the flat style still pursues the minimalist design. It is precisely because of this design principle that the flat style looks clean and tidy with prominent theme, better convey information, and effectively reduce cognitive impairment. After the combination of flat style and new media animation, there are unique narrative rules, modeling rules, and color rules, which help new media animation develop its strengths and avoid its weaknesses. The flat style is relatively simple in production; so, it is conducive to dissemination and suitable for various applications. The design style is concise and clear, which is suitable for the small screen of new media [3].

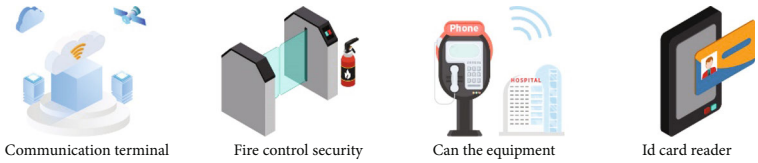

Figure 1: New media flat design legend.

These have played a very powerful role in expanding the application scope of new media. Figure 1 shows the flat design legend of new media.

A deep study on the new theory of machine learning has attracted attention to researchers and technology companies. The essence of deep training is to combine low-level features to create high level representations that classify them and facilitate predictions. Therefore, deep learning is also called a special training that is not controlled. Unlike traditional shallow learning methods such as artificial neural networks and support vector machines, deep learning emphasizes the importance of multilayered and uncontrolled learning [4]. After the combination of flat style and new media animation, there are unique narrative rules, modeling rules, and color rules, which help new media animation develop its strengths and avoid its weaknesses. The flat style is relatively simple in production; so, it is conducive to dissemination and suitable for various applications. The design style is concise and clear, which is suitable for the small screen of new media [5]. These have played a very powerful role in expanding the application scope of new media.

This paper focuses on the algorithm application rules and methods for in-depth study of the new media animation plane model. In particular, as an example of face recognition based on in-depth research of animation, I hope that this paper can combine the topics of theory and practice to explain, enrich the relevant theoretical research, and provide theoretical guidance for the use of flat patterns in the field of animation.

2. Literature Review

Aiming at this research problem, Gao and others studied the unique advantages of flat design in the abstract expression of innovative functions of interactive interface design, the visual form of abstract trend and the intuitive path of information flow and put forward reasonable suggestions for the development of interactive design [6]. Zhou and others analyzed the problems of new media animation in the process of social development, then focused on the practical application of flat design and new media animation, and put forward relevant suggestions for the communication and reference of relevant people in the society [7]. By analyzing the characteristics and advantages of flat design, Chai and others introduced and expanded the "flat" design theory into the production of new media animation, which can provide rich inspiration for the transformation of new media animation [8]. Sobri and others believe that the flat style is very in line with the application requirements of new media animation due to its unique artistic form and simple production method [9]. Deng and others believe that the flat design style itself has a lot of space worth exploring. If it is implemented into the design of new media interaction device at the same time, it will produce an innovative effect as violent as "chemical reaction." Whether starting from the form of design or implementing to specific products, this will be a work full of innovation [10]. Hu and others focused on analyzing the connotation and functional orientation of new media design and discussed the flat characteristics of new media design and its application principles in new media design [11]. Rasmitadila and others found that flat design has really become a trend. More and more new media terminal interactive interfaces adopt flat layout, which completely subverts the mainstream quasi materialized design style for a long time. The so-called flattening is not a simple simplification in form, but an evolution that returns to the essence of design [12]. Gries and others take the operation mode, operation process, interface design, and production process of Sasa rescue app as an example, how to make users call for rescue quickly without obstacles through the use of flat interface design, and how to improve the user experience with personalized design [13]. Yin and others put forward the evolutionary flat 2.0 style logo design method of light and shadow, which makes it shine in front of people, makes the logo design more pleasing to the eye, and is suitable for the inheritance and development of the tide in the current new media era, which is also the main purpose of this paper [14]. Taking the new media era as the research background, Dong and others first made a preliminary exposition of the concepts of visual communication and visual symbols and defined the research content of real estate advertising under the new media. Through the comparative study of traditional media real estate advertising and new media real estate advertising, it is concluded that new media real estate advertising has the advantages of digitization, strong interaction, and accurate focus [15]. On the basis of existing research, I hope this paper can conduct a comprehensive study on new media design on the basis of in-depth training, explain the topic of combining theory with practice, enrich relevant theoretical research, and provide theoretical guidance for use. Flat style in new media is as follows: DBNs compare the new media animation method with other methods, and the results show that DBN has the highest recognition rate. It should be noted that the accuracy of the DBN method is 23.79%, 4.31%, and 4.80% higher than that of MLP under 16×16, 32×32, and 64×64, respectively. The recognition performance of DBNs is almost the highest. Although the classical SVM method has achieved 98.11% recognition rate on 32×32 image, which is higher than the DBN method, the fluctuation of the SVM method is relatively large, and the recognition rate on 16×16 image has declined greatly. Relatively speaking, the recognition rate of the DBN method is relatively stable.

3. Method

3.1. Basic Principles of Deep Belief Network

3.1.1. Deep Belief Network. Deep belief the Internet consists of several levels. The adjacent electron energy levels can be divided into a single restricted Boltzmann machine. In other words, DBN is composed of several RBMs. The basic working principle of DBNs is that the export of the next layer is used as the input of the next layer, and the export of the next layer is used as the input of the top layer for transmission. The acquisition performance of DBNs is obtained according to the fine-tuning of the errors of main parameters and weight values. The steps of DBNs mainly include pre learning or pre learning and fine tuning [16].

The whole process of pre practice is a bottom-up unsupervised learning process. Because RBM has no ability to model the initial features, it needs a more professional Internet to model the features. The practical effect of the layer training method of not supervising the greedy layer is very good. This kind of method is also called brightness contrast emission method (CD). In addition, according to the step-by-step learning model of mixed mode, the lower bound of the likelihood probability of exercise data information is reasonably defined. RBM is an energy entity model. The correlation between visible layer and hidden layer can be shown by energy function formula as follows: the whole process of pre exercise is a whole process of bottom-up unsupervised learning. Because RBM has no ability to model the initial features, it needs a more professional Internet to model the features. The practical effect of the layer training method of not supervising the greedy layer is very good. This kind of method is also called brightness contrast emission method (CD). In addition, according to the step-by-step learning model of mixed mode, the lower bound of the likelihood probability of exercise data information is reasonably defined.

$$E(v,h;\theta) = -\sum_{i=1}^{V}\sum_{j=1}^{H} w_{ij}v_i h_j - \sum_{i-1}^{V} b_i v_i - \sum_{j=1}^{H} a_j h_j. \quad (1)$$

In formula (1), the state of visible layer nodes is represented by $v_{i,}$ the state of hidden layer nodes is represented by h_i, their values are generally 0 or 1, a_j and b_i represent the corresponding offset, and the connection weight is represented by w_{ij} [17]. The joint probability of visual layer vector generated by the model is

$$p(v;\theta) = \sum_{h} e^{-E(v,h)} / \sum_{u}\sum_{h} e^{-E(v,h)}. \quad (2)$$

The conditional probability between the visible layer and the hidden layer is calculated as follows:

$$\begin{aligned} p(h_j = 1|v) &= \sigma\left(\sum_{i=1}^{V} w_{ij}v_i + a_j\right), \\ p(v_j = 1|h) &= \sigma\left(\sum_{j=1}^{H} w_{ij}h_i + b_i\right), \end{aligned} \quad (3)$$

where $\sigma(x) = (1 + e^{-x})^{-1}$ is the sigmoid function, that is, the nonlinear action function of neurons. In order to further obtain the updated value of RBM model weight parameters, the partial derivative of the logarithm of probability can be obtained, as shown in (5):

$$\Delta w = \varepsilon \frac{\partial \ln p(v)}{\partial w_{ij}} = \varepsilon\left(<v_i h_j>_{\text{data}} - <v_i h_j>_{\text{model}}\right). \quad (4)$$

Among them, the learning rate is marked with formula calculation, which indicates the expectation of input data. In daily life, it is usually difficult to obtain an unbiased sample, and the network weight value is usually upgraded by sampling the reconstructed data in the way of application contrast divergence [18]. The input of the next layer comes from the export of the previous layer for transmission. The initial training data of the first input layer usually comes from the observation independent variable, which is usually the gray level definition value of the image.

Adjustment is a process before and after training. All reset RBMs are concatenated according to the training coding sequence to produce a deep belief network. Equation (5) is the loss function of input data and reconstructed data:

$$L\left(x, x'\right) = \left\|x - x'\right\|_2^2, \quad (5)$$

where x is the input data, and x' represents the reconstructed data. The 2-norm form of reconstruction error is represented by the symbol $\|\cdot\|_2$. In order to obtain the updated value of the weight, then calculate the partial derivative of the weight for the error loss function.

3.1.2. Fusion of Deep Belief Network and Multilayer Perceptron. Although the deep belief network has strong self-learning ability without supervision, it cannot be used for classification at the same time. In order to better solve this problem, we clearly put forward a new way of Internet media animation facial expression identification based on the combination of deep belief network and multilayer perceptron (MLP). Therefore, the deep belief network entity model has the ability to identify facial expressions. The flow chart of the combination of deep belief network and multilayer perceptron is shown in Figure 2 below. This method includes three important links: feature learning and training of deep belief network, MLP reset, and facial expression identification results [19, 20]. The feature learning training of belief network includes model fitting, prepractice, and adjustment, learning and training the key features (initial definition features) of the initial facial expression image of Internet media animation, and

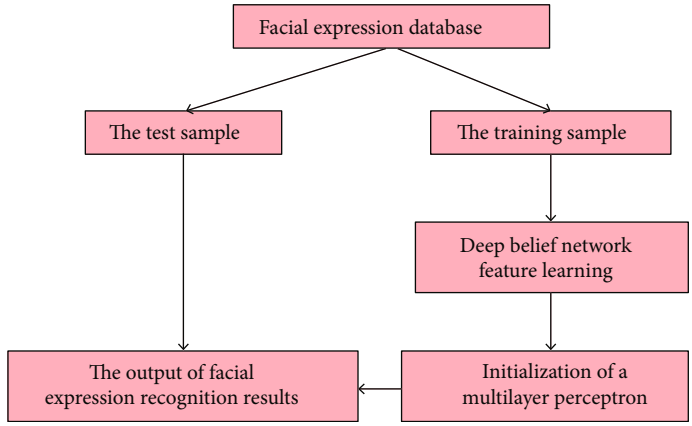

Figure 2: Flow chart of fusion of deep belief network and multilayer perceptron.

obtaining higher-level other abstract features. Because DBNs is actually a deep learning training neural network with several hidden layers, the high-level abstract features obtained can be used for the hidden layer of each DBNs. Throughout the film, the abstract features are learned from the arm.

3.2. Flat Design Method of New Media Animation. There are obvious differences between flat style and realistic style in modeling design. Realistic style modeling design pursues realistic effect; so, there will be many cumbersome details in modeling. The shape of the flat style is how to change and symbolize. Therefore, the whole shape will also reflect a strong beauty of rules, order, and form. Flat style refers to the organic generalization, regularization, and orderly treatment of a large number of natural shapes and complex colors in life, so as to achieve formal beauty [21]. Traditional animation, represented by Disney, generally follows the creative process of summarizing complex objects into basic geometric shapes, and then artistic processing, plus various details. This is a process of "addition." Because the flat style modeling has general characteristics, the flat style animation modeling is especially suitable for the small-size screen of new media, which is simple, clear, and easy to understand. On the contrary, if the flat style is applied to the traditional cinema animation, the picture will appear very boring, thin, and lack of level and detail. In the creation process of flat style modeling, the first consideration is how to use the flat technique to deal with all kinds of shape modeling. The most important thing in modeling is to abide by the principle of generalization. After generalization, induction, eliminating complexity, leaving simplicity, eliminating the rough, and extracting the essence, we get a generalized shape. In flat style modeling design, we will try to summarize the shape of objects or characters into geometric figures visually. The geometric treatment of triangle or ellipse is adopted, which increases the symbolism and interest compared with realism. The advantages of this are as follows: first, the general modeling is often refined and exaggerated from the characteristics of objects, and the entertainment effect brought by exaggeration is also in line with the requirements of new media animation. Second, the generalized modeling has more recognition on the small-scale screen of new media, and the audience has no cognitive impairment.

Because the shape of flat style modeling is quite simple, color is particularly important in flat style modeling. There are obvious differences between the color of flat style new media animation and traditional animation. Although the traditional cinema animation will also be subjective in color processing, it cannot avoid subconsciously pursuing natural and realistic colors and emphasizing the effect of light and shadow. However, the color of flat style is completely subjective, unnatural, a simple color form after a lot of generalization and exaggeration. The color of flat style modeling is more simple after generalization. In the application of color, the main style is often the same color or contrast color. The overall effect of modeling color is controlled by adjusting the saturation and transparency of color, so that the color effect looks unified and not monotonous. In addition, in the design, the primary and secondary colors are mostly orange, green, and purple. Such color matching makes the picture color bright and makes the audience happy. When selecting similar colors, one basic color will be used to match 2-3 other colors, and similar changes will be designed by using two adjacent colors. Retro color has also become a popular color in the flat style. It takes red, pink, orange, yellow, and blue as the common colors. Although the color matching saturation is relatively low, adding white on this basis can make the color softer, which is also a more common color in the flat style [22].

The color in flat style modeling can enhance the entertainment of new media animation, which is inseparable from the psychological hint of color. From the above analysis, we have obtained some laws of the application of flat style color in new media animation, mainly using generalization, simple color, and pursuing the brightness of the overall effect. The lightness and melancholy of color are related to the lightness and purity of color. Bright colors with high lightness have bright pleasure, and all gray colors have melancholy. Color matching with too low lightness is easy to produce melancholy, while color matching with high lightness will produce lightness and pleasure. Strong contrast tone has bright pleasure, and weak contrast tone has melancholy [23].

3.3. Animation Image Restoration Algorithm Based on Deep Reinforcement Learning

3.3.1. Reinforcement Learning. Reinforcement learning is an important branch of machine learning. The training of reinforcement learning agent is based on its own exploration in the environment, rather than the training samples provided by human beings. The return information returned by the environment enables the agent to continuously optimize the strategy. The goal of reinforcement learning algorithm is to maximize the discount return, that is,

$$R_t \longleftarrow \sum_{k}^{\infty} \gamma^k r_{t+k+1}, \tag{6}$$

where $0 \le \gamma \le 1$ is the discount factor. When the agent is in the state S_t, it selects an action according to the strategy π. The a_t learning algorithm is a kind of reinforcement learning algorithm. The agent returns a return value r_t according to the state S_{t+1} in the environment. The QQ learning algorithm can be expressed as

$$Q_{t+1}(s_t, a_t) = Q_t(s_t, a_t) + \alpha\left(r + \gamma \max_{a_{t+1}} Q_t(S_{t+1}, a_{t+1})\right), \tag{7}$$

where α is the learning rate of the algorithm. In the process of reinforcement learning, this algorithm is proved to converge to obtain the optimal value function.

3.3.2. Deep Reinforcement Learning. DQN update formula is as follows:

$$Y_t^Q = R_{t+1} + \gamma \max_a Q\left(S_{t+1}, a; \theta_t'\right). \tag{8}$$

The Double-q algorithm is introduced into the strategy iteration process of deep reinforcement learning:

$$Y_t^{\text{DubleQ}} = R_{t+1} + \gamma Q\left(S_{t+1}, \arg\max_a Q\left(S_{t+1,a;\theta_t}\right); \theta_t'\right). \tag{9}$$

Different from the previous double dqn, ddpg separates the action selection from the learning task of the value function network and uses the AC framework to convert the action selection algorithm from the greedy algorithm to the expected sum of the input human value function, the output is the action value, and the loss function is the neural network to maximize the action return. The actor network update gradient is

$$\nabla_{\theta^\mu} J = E_{xt\sim\rho^\beta}\left[\nabla_{\theta^\mu} Q\left(x, a\middle|\theta^Q\right)\Big|_{x=x_t, a=\mu(xt)} \nabla_{\theta^\mu}\mu(x|\theta^\mu)\Big|_{x=x_t}\right]. \tag{10}$$

The critical network update gradient is

$$L\left(\theta^Q\right) = E_{x_t\sim\rho^\beta a_t\sim\beta, r_i\sim E}\left[\left(Q\left(x_t, a_t\middle|\theta^Q\right) - y_t\right)^2\right]. \tag{11}$$

When updating two network parameters, use the iterative formula with τ as the parameter:

$$\theta' = \tau\theta + (1\text{-}\tau)\theta'. \tag{12}$$

The double dqn probability leads to the value function of the previous n step to calculate the maximum value, which reduces the systematic error of the algorithm from the bow of the maximum function. The network update of ddpg is to weight multiple previous networks to ensure that the value function used in calculating the network update gradient is the mathematical expectation of all previous value functions and weaken the impact of negative update vector on network update [24].

3.3.3. Algorithm Idea. Algorithm idea is as follows: transform the animation image restoration work into a reinforcement learning task and endow it with the corresponding data processing ability. Learning goal is as follows: the agent processes the animation image and changes the color of the pixels of the animation image, so that the difference between the final generated animation image and the target animation image becomes smaller and smaller.

$$D\left(F_{t+1}\middle\|F_{\text{target}}\right) \le D\left(F_t\middle\|F_{\text{target}}\right). \tag{13}$$

If and only if the above inequalities are equal and equal to 0, the learning task is considered to be completed. Therefore, we can define the reinforcement learning return formula:

$$R_t = -D_{KL}\left(F_{t-1}\middle\|F_{\text{target}}\right) - D_{KL}\left(F_t\middle\|F_{\text{target}}\right). \tag{14}$$

If and only if the two are equal, there is the greatest return. Because the agent will always explore modifying the animation image in the environment, there is always a difference between them. Finally, it will fluctuate up and down in the optimal solution to obtain the optimal strategy. The action values are listed in Table 1.

4. Experiment and Analysis of Facial Expression Recognition in New Media Animation

4.1. Experimental Setting. In order to better verify the use characteristics of this method in Internet media animation facial expression recognition, we carried out Internet media animation facial expression recognition experiments using two standard databases (Jaffe database and Cohn Kanade database). Every database has seven basic expressions: happiness, sadness, anger, fear, surprise, boredom, and neutrality. The Jaffe expression database is a database based on seven basic expressions. The pictures in the database take 10 Japanese women as the sample version and collect 7 expressions of each person. Each look has about 3 or 4

Table 1: Action value table.

Action	Value
R	$[-1, 1] \times 255$
G	$[-1, 1] \times 255$
B	$[-1, 1] \times 255$

Table 2: Correct recognition rate of new media animation facial expression obtained by DBNs on image a in the Jaffe database (%).

Hidden layer node Number of hidden layers	50	100	200	300	400	500
1	85.32	87.09	88.57	85.69	85.69	87.10
2	82.41	84.69	80.99	78.60	65.69	63.79
3	16.59	15.82	11.89	11.89	10.50	10.47

Table 3: Correct recognition rate of new media animation facial expression obtained by DBNs on image 16×16 in the Jaffe database (%).

Hidden layer node Number of hidden layers	50	100	200	300	400	500
1	80.5	84.31	80.51	84.8	88.11	89.05
2	80.5	80.1	84.31	82.79	85.69	84.69
3	61.89	16.55	55.31	66.76	65.19	14.60

Table 4: Correct recognition rate of new media animation facial expression obtained by DBNs on 64×64 image in the Jaffe database (%).

Hidden layer node Number of hidden layers	50	100	200	300	400	500
1	27.59	88.11	90.89	90.95	87.59	90.51
2	14.31	65.69	81.89	85.32	81.89	85.32
3	6.20	10.51	35.69	44.67	47.59	49.49

interfaces, a total of 213 images. The definition of each image is 256256.

In order to ensure the stability of the recognition results, five crossvalidation experiments are selected to divide the mean value of all image samples into five parts, four for practice, and one for detection. The recognition experiment is repeated five times, and finally, the average of the five times is taken as the recognition result. In the construction of the DBN solid model, the connection points of visual effect layer are equivalent to the obtained feature dimension [25]. In the training process, the number of cycles of DBNs pretraining is 200, and the number of cycles of fine tuning is 500, so as to achieve better convergence effect. DBNs can only be used for feature learning without classification function. In order to use DBNs for the classification of facial expressions, I input the abstract feature attributes finally learned by DBNs (the optimal value of the network weight of the hidden layer) into the hidden layer in the traditional multilayer perceptron (MLP). That is, after the training of DBNs, the optimal network weight value of the last hidden layer is used to initialize the hidden layer network weight value of the traditional MLP model, and then the initialized MLP model is used to train and test the new media animation facial expression image samples, so as to realize the recognition of new media animation facial expression.

4.2. Experimental Results of Facial Expression Recognition of Original Pixels of New Media Animation Based on DBNs. In Tables 2–5, the images in the Jaffe database are used for the experiment. In this experiment, the expression images of the original pixel 256×256 are sampled to obtain three image samples of different resolution sizes 16×16, 32×32, and 64×64, and then DBNs are used to carry out expression recognition experiments on three image samples of different resolution sizes.

It can be seen from the experimental results in Tables 2–4:

(1) In Jaffe database query, the maximum recognition accuracy of DBNs for image samples with different resolution sizes of l6 $\times$ 16, 32×32, and 64×64 is 88.57%, 89.05%, and 90.95%, respectively. The smaller the resolution of Internet media animation image, the less practical information content included, and the lower the image quality, which is unfavorable to the classification of expression. As everyone knows, the recognition performance of DBN for image samples with these three resolution sizes is very close. This shows that DBN has strong unsupervised characteristics and self-learning ability. Even when classifying images with a minimum resolution of 16×16, almost the same recognition performance can be obtained as when the resolutions are 32×32 and 64×64

(2) When the number of hidden layers is 1, DBNs mainly performs best. With the increase of the number of hidden layers, its recognition performance decreases slowly. But generally speaking, the more hidden layers of DBN, the stronger its self-learning ability. The fundamental reason is that the query of the Jaffe database is relatively small. 213 sample versions were applied in this experiment. This shows that only one hidden layer is sufficient DBN to solve the data information of discriminant analysis

Tables 6–9 are experiments with pictures in the Cohn Kanade database. In this experiment, three new media animation image samples with different resolution sizes of l6 $\times$ 16, 32×32, and 64×64 are also used, and then DBNs are used to carry out expression recognition experiments on three image samples with different resolution sizes.

It can be seen from the experimental results in Tables 6–8 that the highest recognition accuracy of the DBN method for three new media animation image samples with different

Table 5: Correct recognition rate of various expressions when DBNs perform best in the Jaffe database (%).

	Get angry	Happy	Sadness	Be surprised	Disgusting	Fear	Neutral
Get angry	92.86	0	0	0	3.58	3.58	0
Happy	0	87.10	3.23	0	0	0	9.69
Sadness	0	3.33	93.34	0	0	0	3.34
Be surprised	0	3.33	0	93.34	0	3.34	0
Disgusting	3.54	0	3.44	0	82.76	10.35	0
Fear	0	0	3.15	3.13	3.13	87.5	3.13
Neutral	0	0	0	0	0	0	100

Table 6: In Cohn_Correct recognition rate of new media animation facial expression obtained from image l6 × 16 by DBNs in the Kanade database (%).

Hidden layer node Number of hidden layers	50	100	200	300	400	500
1	92.87	96.67	96.67	91.44	88.11	72.86
2	72.87	81.44	75.58	84.29	61.91	57.15
3	38.10	32.87	33.34	32.82	24.29	21.44

Table 7: In Cohn_Correct recognition rate of new media animation facial expression obtained from 32 × 32 image by DBNs in the Kanade database (%).

Hidden layer node Number of hidden layers	50	100	200	300	400	500
1	90.48	93.82	97.19	95.24	91.41	96.18
2	68.10	89.05	91.44	94.75	82.84	89.99
3	23.34	52.86	60.01	47.15	30.94	40.49

Table 8: In Cohn_Correct recognition rate of new media animation facial expression obtained from 64 × 64 image by DBNs in the Kanade database (%).

Hidden layer node Number of hidden layers	50	100	200	300	400	500
1	61.89	15.24	91.89	91.41	97.60	98.57
2	11.43	11.89	87.61	84.75	90.94	89.04
3	10.1	10.48	22.38	48.08	37.13	29.9

resolution sizes of 16 × 16, 32 × 32, and 64 × 64 in the Cohn Kanade database is 96.67%, 97.19%, and 9857%, respectively. This once again shows that the DNBS model has strong learning ability of unsupervised characteristics. The diagonal data in Table 9 is the correct recognition rate of seven expressions when the recognition rate reaches 98.57%. It can be seen from the experimental results in Table 9 that among the seven expressions, except for neutral facial expressions, the recognition rate of other expressions has reached 100%, and the recognition rate of neutral expressions has also reached 90%.

4.3. Performance Comparison. Taking three new media animation images with screen resolutions of 16 × 16, 32 × 32, and 64 × 64 in the Jaffe database and Cohn Kanade database as samples, this experiment compares DBNs with five other typical classification methods such as nearest neighbor (NN), multilayer perceptron (MLP), and support vector machine (SVM) and compares the recent subspace (NS) which has developed rapidly in recent years with rarity.

Nearest neighbor method (NN) is a k-nearest neighbor classifier (KNN) based on sample learning, which is a case when $k = 1$. Multilayer perceptron (MLP) belongs to a traditional neural network classifier. In this paper, the MLP adopts a model structure with a hidden layer. The number of nodes in the hidden layer is 50100200300400500, respectively, and then the best recognition result is taken as the final result of MLP. The Internet weight value of MLP hidden layer is randomly generated. SVM algorithm (SVM) is a classifier based on statistical analysis and learning theory. In this paper, SVM selects various types of classification optimization algorithms of ″″, and the kernel function is radial basis function. The variable value of the kernel function is improved; that is, crossvalidation is carried out on the data information of training samples. Recent vector space and sparse representation classification are non main parameter classifiers reconstructed from data signals. The main idea of NS is to show the linear combination of various training samples of the test sample and select the optimal solution for classification, while the main idea of SRC is to find the sparse representation to identify the test sample, and then carry out classification according to the sparse solution.

Figure 3 shows the comparison of the recognition performance of three new media animation image samples with different resolution sizes 16 × 16, 32 × 32, and 64 × 64 by various classification methods under the Jaffe database. According to the experimental results in Figure 3, DBNs have the highest recognition performance. It is worth mentioning that the correct recognition rate of the DBN method on 16 × 16, 32 × 32, and 64 × 64 is 23.79%, 4.31%, and 4.80% higher than that of MLP, respectively. MLP is also used in the last step of the DBN method. The difference between MLP and MLP mainly lies in the initialization of hidden layer network weight value. The DBN method is to input

Table 9: Correct recognition rate of various expressions when DBNs perform best in the Cohn Kanade database (%).

	Get angry	Happy	Sadness	Be surprised	Disgusting	Fear	Neutral
Get angry	100	0	0	0	0	0	0
Happy	0	100	0	0	0	0	0
Sadness	0	0	100	0	0	0	0
Be surprised	0	0	0	100	0	0	0
Disgusting	0	0	0	0	100	0	0
Fear	0	0	0	0	0	100	0
Neutral	0	0	3.33	0	3.3	3.3	90

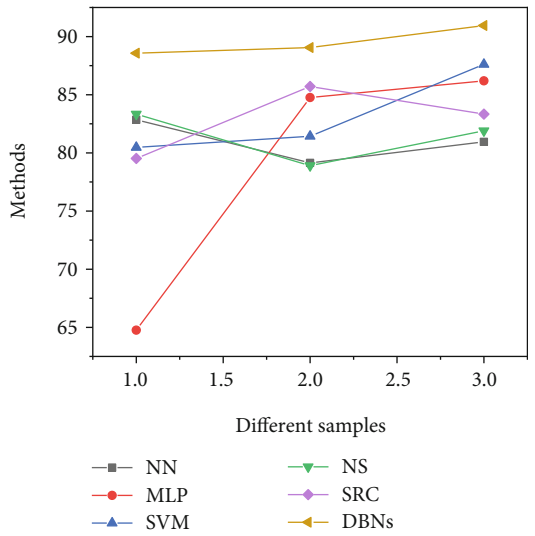

Figure 3: Performance comparison of different classification methods in the Jaffe database.

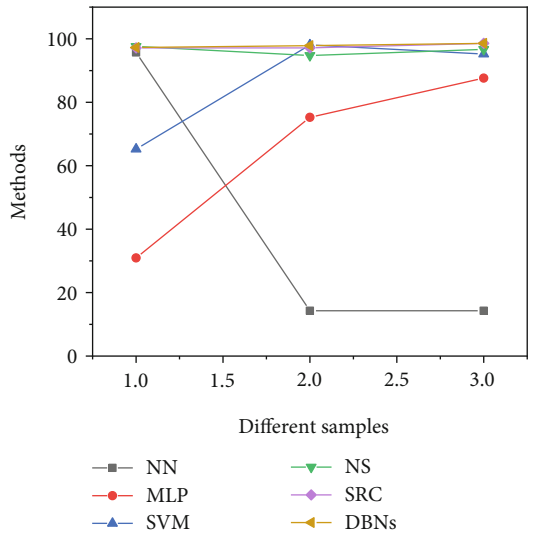

Figure 4: Performance comparison of different classification methods in Cohn Kanade database.

the higher-level abstract feature attributes (the optimal value of the network weight of the hidden layer) finally learned into the MLP, which is used to initialize the hidden layer network weight value of the MLP. The initialization of the network weight value of the traditional MLP hidden layer is generated randomly, and there is no automatic learning function. The experimental results in Figure 3 show the importance of the unsupervised feature learning ability of DBNs.

Similarly, Figure 4 shows the comparison of the recognition performance of three new media animation image samples with different resolution sizes 16×16, 32×32, and 64×64 by various classification methods in the Cohn Kanade database.

As can be seen from the experimental results in Figure 4, the recognition performance achieved by DBNs is almost the highest. Although the classical SVM method has achieved 98.11% recognition rate on 32×32 image, which is higher than the DBN method, the fluctuation of the SVM method is relatively large, and the recognition rate on 16×16 image has declined greatly. Relatively speaking, the recognition rate of the DBN method is relatively stable.

5. Conclusion

This paper clearly puts forward a research idea of flat design of new media design scheme based on deep learning and discusses the application standard and mode of deep learning optimization algorithm in flat icon of new media animation. Taking the animation facial emotion identification based on in-depth learning as an example, this paper discusses this theme according to the method of close combination of theoretical research and practice, hoping to enrich the relevant theoretical basic research and give theoretical innovation for the use of pattern design style in new media. At this stage, the new media animation of floor plan design style has long been widely used in mobile games. In the future, it will also be more widely used in other fields. For example, in education, popular science and children's education apps will prefer flat design style without cognitive impairment. Many foreign children's education apps have integrated flat style animation into it.

Data Availability

No data were used to support this study.

Conflicts of Interest

The author declares that he/she has no potential competing interests in our paper.

Authors' Contributions

And the author has seen the manuscript and approved to submit to your journal.

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